

**STATE OF GEORGIA**  
**TMDL IMPLEMENTATION PLAN**  
**FLINT RIVER BASIN**

**FISH CONSUMPTION GUIDELINES DUE TO MERCURY**

**Prepared by**  
**The Georgia Department of Natural Resources**  
**Environmental Protection Division**  
**Atlanta, GA**

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies.

**This Implementation Plan is applicable to the following segments in the Flint River Basin:**

<b>Impaired Waterbody</b>	<b>Location</b>	<b>County</b>	<b>Miles/Area Impacted</b>
Beaver Creek	Headwaters to Patsiliga Creek	Taylor	6
Patsiliga Creek	Beaver Creek to Flint River	Taylor	6

## **INTRODUCTION**

The Environmental Protection Agency has developed total maximum daily load (TMDL) documents for the streams list above that are on Georgia's 303(d) list for total mercury in fish tissue residue. The allowable load of mercury that may come into the listed segment of Beaver and Patsiliga Creek without exceeding the applicable water quality standard is 0.14 kilograms per year. The applicable water quality standard is the State of Georgia's numeric interpretation of the narrative water quality standard for protection of human health from toxic substances. This interpretation provides that total mercury in Beaver and Patsiliga Creek shall not exceed the level that will result in more than 0.3 mg/kg of mercury in fish tissue residue.

This TMDL may be revised when more information is available. Therefore, EPA proposes a phased approach. This phased approach recognizes that with more information, the assumptions on which the TMDL is based may have to be modified to achieve compliance with any applicable water quality standard. Implementation of the TMDL should also follow a phased approach and be subject to changes as more information becomes available.

## **DISCUSSION OF POLLUTANT**

Mercury is a toxic metal and a naturally occurring element found throughout the environment. It is commonly seen as a shiny, silver-white, odorless liquid metal. According to EPA, mercury is one of the persistent, bioaccumulative, and toxic, or PBT, pollutants. Human activity can cause a release of mercury increasing the presence of this toxic element in the atmosphere. The three forms of mercury are methyl, elemental, and inorganic. The elemental or inorganic forms are usually the forms released to the environment. Methylmercury is an organic form that is more toxic and bioaccumulates in the food chain.

The main concern is the exposure to mercury of the developing fetus. Because its brain is rapidly developing, the fetus is more sensitive, and women of childbearing age are at the greatest risk. Human exposure to mercury occurs through the consumption of contaminated fish, as mercury concentrations in the air are usually low. Other groups at risk are subsistence fishermen and some Native American populations.

## **POLLUTANT SOURCES**

EPA attributes 99% of the mercury in our water to atmospheric deposition. Only 1% is said to come from point sources. In water, the mercury is changed by biological processes to methylmercury which bioaccumulates in fish. The largest sources of mercury air emissions are:

- Coal-fired electrical utilities
- Municipal waste combustors
- Medical waste incinerators
- Hazardous waste combustors

Other sources of mercury include manufacturing activities, mining, and wastewater effluents.

There is not much data on mercury concentration in wastewater effluents. These point sources are listed in the TMDLs as having the potential to discharge mercury but, until recently, the method for analyzing mercury was not sensitive enough to measure the low trace levels found in effluents.

## **SOLVING THE PROBLEM**

Mercury coming from power plant stacks and other sources is carried by the wind and can travel for great distances depending on atmospheric conditions. This is a global problem and EPA is working with other countries to limit mercury releases worldwide. EPA intends to require reductions in the emission of mercury from coal and oil fired

utilities. EPA proposed a rule to permanently cap and reduce mercury emissions from coal and oil fired power plants on December 15, 2003. This was followed by a supplemental rule on February 24, 2004. The supplemental rule includes a model "cap-and-trade" program, monitoring and reporting requirements for mercury. The "cap-and-trade" approach will reduce mercury emission by 70% when fully implemented. EPA will issue final regulations by December 15, 2004. According to the TMDLs for fish contaminated with mercury, "EPA expects that a combination of ongoing and future activities under the Clean Air Act will achieve reductions in air deposition of mercury that will enable achievement of water quality standards."

EPA finalized rules for municipal waste combustors and hospital incinerators and there was almost 90% reduction in mercury emissions between 1995 and 2000 from these sources. A voluntary agreement has been achieved between the American Hospital Association and EPA to eliminate mercury waste by 2005 from hospitals.

Industrial demand for mercury declined approximately 75% from 1988 to 1996. For example, mercury is no longer added to paint or pesticides and is used less in batteries.

## **PLAN FOR IMPLEMENTATION OF TMDL**

The impairment of Beaver Creek and Patsiliga Creek by mercury is largely due to the deposition of mercury from the atmosphere. The TMDL estimates that over 99 percent of the pollutant loads to the waterbodies come from the atmosphere. Less than 1 percent of the mercury loading into Beaver and Patsiliga Creek is due to discharges from water point sources into Beaver and Patsiliga Creek or their tributaries.

Major NPDES facilities on a 303(d) listed stream for mercury or fish contaminated with mercury will have a monitoring requirement put in the permit. The permittee will characterize the effluent and the source of drinking water in the area for mercury concentrations through this monitoring. If the mercury concentration in the effluent is greater than the water quality target mentioned in the TMDL or greater than the mercury concentration in the source of drinking water, then the permittee will have to develop and implement a mercury minimization plan. This mercury minimization plan will involve source identification and then the reduction and elimination of mercury from the effluent.

Air point sources will continue to reduce emissions of mercury through implementation of the Clean Air Act. EPA and the regulated community will improve the mercury air emissions inventory. EPA will revise the mercury air deposition model to get better characterizations of the sources of mercury.

## **MONITORING PLAN**

EPA and EPD will continue to collect ambient data on mercury concentrations in water, sediments, and fish. There is relatively little data on the actual loading of mercury from

NPDES point sources in the basin. Until recently, EPA's published method for the analysis of mercury was not sensitive enough to measure mercury at low trace level concentrations. Most NPDES facilities have not detected mercury during their required priority pollutant monitoring. EPA assumes that all facilities discharge some mercury with their effluent because mercury is pervasive in the environment and is present in rainwater.

In 1998 EPA adopted a new analytical procedure (EPA Method 1631) that detects mercury at low trace level concentrations (0.5 nanograms/liter). As NPDES permits are reissued, dischargers will be required to use Method 1631 for analyzing mercury. The data on the concentration of mercury in point source discharges using the more sensitive analytical technique will be available to characterize the actual loading of mercury into Beaver and Patsiliga Creek. EPA will use the data and information collected and developed during the next ten years to revise the Phase 1 TMDL, as necessary, to assure that the allowable load will be achieved by implementation of the TMDL.

## **EDUCATION/OUTREACH ACTIVITIES**

The Environmental Protection Division will continue to provide guidance and education to the public on all water quality issues through outreach by the Water Protection Branch. The Pollution Prevention Assistance Division is another excellent resource for this outreach. When necessary, the Department of Natural Resources will issue fish consumption guidelines. These guidelines are updated annually, identify specific stream segments where there is a problem, and list all known species of fish with mercury contamination and how often they may be consumed.

## **REFERENCES**

Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6-.03,  
Water Use Classifications and Water Quality Standards,  
Revised February 2004.

USEPA, 2003. Total Maximum Daily Load for Total Mercury in Beaver and Patsiliga Creeks, Flint River Watershed, Georgia. February 2003.

USEPA, 2004. EPA Fact Sheet: EPA Proposes Options for Significantly Reducing Mercury Emissions from Electric Utilities, Revised January 29, 2004.